



Media Notes

for North Carolina Growers

NCDA&CS Agronomic Division

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Micronutrients: When Enough is Enough

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Micronutrients play a major role in the production of healthy container plants. They are involved in every aspect of plant growth. Without them, plants fail to grow properly and, indeed, may become discolored and unsuitable for marketing.

"Micro" means small or trace. Therefore, micronutrients are those needed in minute amounts to produce healthy plants. They comprise boron, copper, iron, manganese, molybdenum and zinc. Most of these are present in commercial potting media. However, in cases where a given element is low, it should be applied to the media . . . in very small amounts.

Although micronutrients are essential for plant growth, the amounts required to grow plants successfully are infinitely small compared to other essential nutrients. Furthermore, the margin between deficient and toxic levels is quite narrow. This is particularly true for zinc, copper and boron.

Soil test data from native pine bark collected from several locations over time show adequate levels of manganese and zinc. The amount of copper in pine bark is generally very low. Other micronutrients such as iron, boron and molybdenum are not tested in soils or bark media and may require supplementing with other fertilizer treatments. Plant tissue analysis can be used to determine if these elements are being adequately provided.

Soil test data have linked excessive zinc levels to growth problems of container-grown crops. The high zinc content generally comes from application of a trace element mixture to media that already contains

adequate zinc. In such cases the problem could have been prevented by leaving zinc out of the fertilizer treatment.

When the soil test zinc index is above 25 (1 ppm), there should be no need to apply zinc. It is quite common to find zinc index values above 50 in native pine bark. Zinc application under these conditions does more harm than good. Micronutrient application follows the logic that old-timers have proclaimed for years: "If it isn't broken, don't fix it."

A soil test is the only way to determine the level of zinc in your media. Use the guidelines in Table 1 to determine the need for application.

Questions have been raised about the zinc content in dolomitic limestone. Test results from several lime sources show a zinc content of about six pounds per ton. This is equivalent to 0.0003 lb zinc per lb of lime, 0.03 lb zinc per 10 lb lime or 0.48 ounces of zinc per cubic yard of media. Therefore, at these levels, it is highly unlikely that lime is contributing to high zinc in container-grown media. Some dolomitic lime sources contain little or no zinc.

There are several ways to determine when micronutrients are needed:

- have your bulk media tested before potting plants,
- know the content of metals in your micronutrient source,
- apply current recommended rates,
- submit periodic soil samples after micronutrient application,

- make only one application for the duration of the plant,
- take periodic plant tissue samples for monitoring micronutrient status, and
- have your water source tested.

Following these guidelines should prevent micronutrient toxicities. The index values shown in Table 1 indicate the status of manganese, zinc and copper in the soil. Zinc and copper indexes can be converted to parts per million (ppm) as follows:

- $0.04(\text{Zn-I}) = \text{ppm Zn}$
- $0.02(\text{Cu-I}) = \text{ppm Cu}$

Single element micronutrients can be purchased from most fertilizer dealers that cater to farmers. These products are generally water soluble and are suitable for foliar application and injection through the irrigation system. Follow label recommendations for rate of application.

Soil boxes and information sheets for samples are available from local agricultural advisors or the Raleigh office of the Agronomic Division.

Table 1. Micronutrient soil test index rating for manganese, zinc and copper.

<i>Soil Test Index Ranges</i>	<i>Nutrient Status</i>	<i>Micronutrients Needed</i>
0-25	very low to low	yes
26-50 *	adequate	none
51-100 §	high to very high	none
100+ †	excessive	none

* No micronutrients are recommended when the soil test index is above 25.

§ Average soil test levels for manganese and zinc in native bark.

† Levels at which problems may occur.